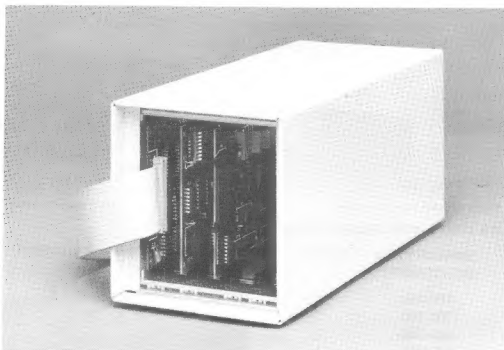




### CUBE ADCU

#### Twelve-bit Analog Data Capture Unit



Twelve-bit Analog Data Capture Unit.

- ★ Mass analog data capture
- ★ High speed, high accuracy and high capacity
- ★ Stand-Alone Unit
- ★ Housed in four-slot mini-rack, with power supply

The CUBE ADCU is a 12-bit analog to digital converter housed in a four-slot mini-rack with built-in power supply, and is supplied as standard with 64kB DRAM. The ADCU is driven via EuroCUBE, and is capable of storing 30,000 values in approximately 4 seconds (i.e. 7 kHz). It is supplied with special machine code software as assembler source code for easy incorporation into a user's program.

CUBAN-12 has eight 12-bit analog input channels, and has options for up to four 12-bit analog output channels.

CU-DRAM is a high performance 64kB dynamic RAM card, with delay-line refresh control for the best performance in stability and reliability. It will also be possible, shortly, to include a further three CU-DRAM cards to provide a total storage capacity of 256kB.

The unit has a EuroCUBE 6502 computer operating under MOSB.2. BBC BASIC can be added if required. The EuroCUBE can communicate with a terminal or other computer via its RS-423/232 serial port.

CUU1291

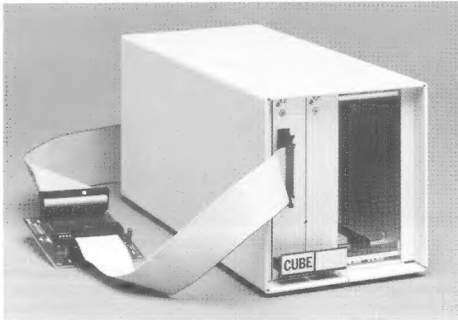
CUBE ADCU (CUBE ANALOG DATA CAPTURE UNIT)  
Stand-Alone Unit, with EuroCUBE independent computer

£795.00

(Prices now include front panels as appropriate.)

**CUBE BeebFLEX**

6809 Second Processor Unit for the BBC Microcomputer



CUBE BeebFLEX 6809 Second Processor Unit.

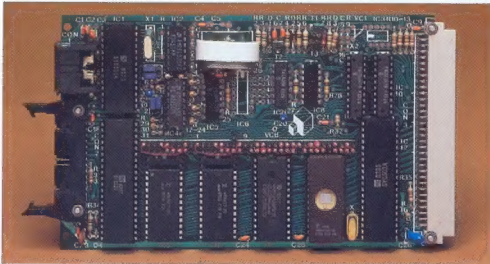
- ★ FLEX is the only truly machine-independent operating system for 8-bit processors. CUBE BeebFLEX reads and runs industry-standard 40 or 80 track (according to drive fitted) FLEX 5¼" diskettes via the BBC Microcomputer.
- ★ Many useful programs, from a wide variety of suppliers, are available to run under FLEX - including macro assemblers and cross-assemblers, compilers and cross-compilers, and high-level languages.
- ★ CUBE BeebFLEX connects to the BBC via the TUBE. It uses the standard BBC Micro disk interface and disk drives, which remain valid for standard BBC Micro purposes.

CUBE BeebFLEX, which is housed in a four-slot mini-rack with a power supply, includes a CU-NINE 6809 CPU card, a CU-DRAM 64kB memory card, and a TUBE interface for connection to the BBC Micro. The remaining two slots are spare for purposes such as extra analog or digital input/output, high-resolution colour video, or EPROM programming.

The FLEX configuration parameters are held in a CUBE sideways ROM resident in the associated BBC Micro. CU-NINE has an operating system ROM which enables FLEX to run on standard BBC Micro disk drives. Using FLEX, applications programs can be generated by the resident assembler or by compilation from a high-level language. The BBC Micro can then be disconnected and the CUBE unit controlled from a CUBE keyboard as an independent unit. Larger racks, up to 19" wide, can replace the four-slot mini-rack, and the 6809 version of the EuroCUBE can replace the CU-NINE, raising the specification to the same as EuroCUBE-65 (see page 4).

CUU0990	CUBE BeebFLEX Second Processor Unit; 6809 cpu, 64kB DRAM, in 4-slot mini-rack, with power supply and front panels	£359.00
FLX0920	FLEX operating system disk with manual for CUBE BeebFLEX	£65.00

## EuroBEEB/EuroCUBE-65 6502 Target/Stand-Alone Processor



EuroCUBE/EuroBEEB 6502 CPU/SBC.

EuroCUBE-65 is a complete 6502 single board computer designed for the industrial environment. EuroBEEB, an enhanced configuration of EuroCUBE-65 with 8kB CMOS RAM and BBC BASIC, is both a low-cost development system and a target system which duplicates the major facilities of the BBC Micro. The MOS-B Operating System supports nearly all the BBC MOS commands, and the BBC BASIC provided on board enables the development and execution of application programs in the familiar software environment of the BBC Micro. The BBC Micro itself can be used as an intelligent terminal and disk file server to EuroBEEB during program development. Files are transferred between disk and the EuroBEEB in target processor mode. Once the application program has been written and tested on EuroBEEB, it can be disconnected for independent operation in stand-alone mode.

- ★ Real-time calendar clock
- ★ Battery back-up for CMOS RAM and clock
- ★ CUBE bus connector for rack-mounting with additional peripheral Eurocards
- ★ ACIA provides RS-423/RS-422 serial interface
- ★ Autorun feature allows Turnkey operation
- ★ Four reconfigurable 28-pin memory sockets take RAM/ROM up to 16kB per byte-wide device
- ★ VIA i/o chip provides 16 digital i/o channels, 4 control lines and 2 timers



EuroBEEB development system in self-powered 4-slot mini-rack.

CUE6501	EuroCUBE 6502, with MOS-B.2 and front panel	£175.00
CUU2750	Mini-rack with 4 Eurocard slots and power supply	£119.00
CUP6521	Serial data cable	£8.00
CUU6538	EuroBEEB-1 (single-card unit) with 8kB CMOS RAM	£269.00
CUU6552	EuroBEEB-2 (with Teletext video)	£445.00
CUU6553	EuroBEEB-3M (high-resolution video - monochrome)	£585.00
CUU6553C	EuroBEEB-3C (high-resolution video - colour)	£729.00

(All prices now include front panels as appropriate.)

## CUBE HI-RES UNIT

Full Colour Graphics Intelligent Display Terminal



CU-GRAPH full colour, high resolution graphics display.

- ★ Provides high resolution (Mode 0) colour graphics and colour text, 80 columns x 32 rows
- ★ Driven serially from BBC, thus uses NONE of the BBC Micro's memory

The CUBE HI-RES UNIT, a full colour graphics display terminal, is designed to receive a serial stream via RS-423/232 and display text/graphics on a colour or mono screen. It is housed in a convenient, enclosed four-slot mini-rack which includes EuroCUBE-65 (the CUBE CPU), and CU-GRAPH, the CUBE high-resolution colour graphics module.

All BBC BASIC graphics commands are supported, and a pseudo matrix of 1024 x 1024 pixels is realised in an actual resolution of 512 x 256 pixels. At the best resolution on the BBC Micro (640 x 256 pixels), all colour commands are reduced to one foreground and one background colour. The CUBE HI-RES UNIT overcomes this limitation, and provides high resolution similar to Mode 0 with all colour facilities of the BBC Micro in Mode 2 (except flashing colours). In addition, the Thompson EF9366 CU-GRAPH graphics controller chip has a built-in character set that permits the user to display a character in its minimum size (as used in 85 columns x 32 rows) or independently enlarged in width and height. Italic and vertical script facilities are also built in.

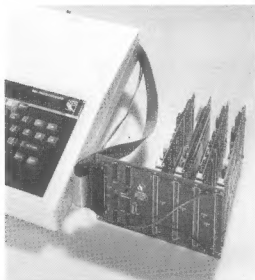
In its full implementation, the CUBE HI-RES UNIT is composed of the following: EuroCUBE, with MOSB.2 and 8 kB CMOS RAM; CU-GRAPH mono and CU-GRAPH colour extension; serial cable; power cable; and the enclosing four-slot mini-rack, with built-in power supply.

CUU6570	CUBE HI-RES UNIT monochrome version (package price)	£625.00
CUU6570C	CUBE HI-RES UNIT, colour version with printer port (package price)	£767.00

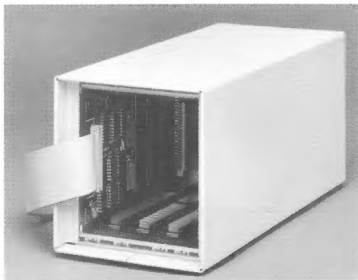
(Prices now include front panels as appropriate.)

## BEEBEX

General Purpose Eurocard Extension Unit for the  
BBC Microcomputer 1 MHz Bus



Economy 4-socket BEEBEX.



Enclosed BEEBEX + power supply.

BEEBEX is probably the most versatile and comprehensive way of extending the BBC Micro, because the CUBE range of Eurocards becomes available as hardware extensions using the 1 MHz bus interface.

The CU-DRAM 64kB dynamic RAM cards, used in conjunction with BEEBEX, provide bulk memory extension for the BBC Microcomputer. An alternative memory extension is provided by CU-MEM, which can carry up to 64kB of battery-backed CMOS RAM.

BEEBEX can also be used with CUBAN-8 and CUBAN-12 – the eight-bit and twelve-bit CUBE analog interfaces. (See also the CUBE ADCU, for mass analog data capture.) CUBIO offers 80 channels of digital i/o; INDIO and the CUBE Delegate Industrial Interface offer opto-isolated heavy-duty switching. See enclosed reply card for full list. The CUBE ROMULATOR is a development tool facilitating the design and testing of machine code applications.

The usefulness of BEEBEX as an extension to the BBC Micro is greatly enhanced by a sideways ROM called ★I/O ("STAR IO"), which provides convenient software access to the CUBE hardware extensions. When called, ★I/O treats all inputs and outputs to external devices in the same way as transferring data to and from a disk file.

In an industrial environment BEEBEX can be used to develop control applications with the BBC Micro, and then use EuroBEEB to replace the BBC in the final system.

CUE2701	"Economy" 4-socket BEEBEX (includes cable)	£77.00
CUU2700	8 Slot BEEBEX Eurorack (includes BEEBEX, Power Supply, Cable and ★I/O)	£405.00
CUU2702	16 Slot BEEBEX Eurorack (includes BEEBEX, Power Supply, Cable and ★I/O)	£445.00
CUU2721	BEEBEX in mini-rack with power supply (without ★I/O)	£195.00
BSK1620	★I/O – The Control ROM	£39.00

(Prices now include front panels as appropriate.)

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## The CUBE Range of BBC Extensions

### CUBE and the BBC

The CUBE range of Eurocards, designed and manufactured in Cambridge by Control Universal, provides compact, robust and well-engineered extensions to the BBC Microcomputer. The Control Universal sales and design engineering teams offer an unsurpassed level of technical support for CUBE BBC extensions, as well as a wealth of innovative industrial computer design.

### CUBE BeebFLEX 6809 Second Processor (p. 3)

CUBE BeebFLEX adds a 6809 second processor to the BBC Microcomputer, enabling it to run the wide range of FLEX software currently available, including most popular high-level languages. This arrangement is particularly suitable for machine code assembly and cross-assembly.

### EuroBEEB/EuroCUBE-65 6502 Target/Stand-Alone Processor (p. 4)

EuroCUBE-65 is a 6502-based multi-function single board computer in Eurocard format. EuroBEEB adds BBC BASIC to provide a low-cost development environment compatible with the BBC Microcomputer. For application development, the BBC Micro can operate as an intelligent terminal and disk file server with EuroBEEB in target processor mode. As a stand-alone processor, EuroBEEB can drive the extensive range of CUBE peripheral/control cards via its CUBE bus interface.

### CUBE Hi-Res Unit (p. 5)

A full colour graphics display terminal which generates a display with a resolution similar to the BBC Microcomputer in Mode 0 (actually 512 x 256) but with the colour facilities of Mode 2 (except flashing colours).

### BEEBEX (p. 6)

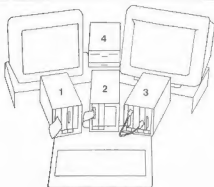
BEEBEX is a convenient 1 MHz bus Eurocard interface which represents a versatile and comprehensive way of extending the BBC Microcomputer and enables it to use the full range of CUBE modules.

### CUBE ADCU - Analog Data Capture Unit (p. 7)

The CUBE ADCU, an example of the versatility of CUBE-extension modules, is a convenient, packaged solution to the demands of mass analog data capture. It includes a 35µS twelve-bit analog to digital converter, and machine code software is supplied which can read and store 30,000 values in approximately four seconds (7 kHz).

### CUBE Disk Packs (back cover)

CUBE disk packs are supplied in attractive beige enclosures, are available in both 40 track and 80 track, and range in capacity from 100 kB to 1.4 MB (with double-density disk interface).



Key to front cover:

1. ADCU (BEEBEX or EuroCUBE-65 + 64kB DRAM + CUBAN-12)
2. 6809 Second Processor (CU-NINE + CU-DRAM)
3. EuroBEEB + CU-DRAM + CU-GRAPH Colour
4. Dual half-height CUBE drive



## CUBE DISK PACKS



Single half-height 40-track boxed disk drive.

Dual half-height 80-track disk drives in full-height enclosure.

### BOXED DISK UNITS, FOR USE WITH BBC MICROCOMPUTER

CODE	CAPACITY, KB S/D DENSITY	DRIVES	TRACKS	SIDES	BOX HEIGHT	PRICE
CUU3111	100/180	1	40	SINGLE	HALF	£159.00
CUU3116	100/180	1	40	SINGLE	FULL	£186.00
CUU3112	200/360	2	40	SINGLE	FULL	£309.00
CUU3141	400/720	1	80	DOUBLE	HALF	£252.00
CUU3146	400/720	1	80	DOUBLE	FULL	£283.00
CUU3142	800/1440	2	80	DOUBLE	FULL	£499.00

OPT1000 Full height boxes may alternatively be supplied with a built-in power supply option £25.00

CUBE BBC DISK PACKS are supplied with a comprehensive user manual and an easy-to-use utilities disk. All versions are supplied in cream textured metal boxes complete with power and data cables.

BBM1440 Microware Double Density Filing System £95.00

### CUBE CATALOGUE

The best catalogue ever – the complete guide to the whole CUBE range, BBC computers, printers, videos, software and media. Telephone our newly-enlarged team of sales engineers for professional guidance and advice.

*Free from*

#### Control Universal Ltd

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All prices quoted exclude VAT and are applicable from 1 July 1984 until further notice.